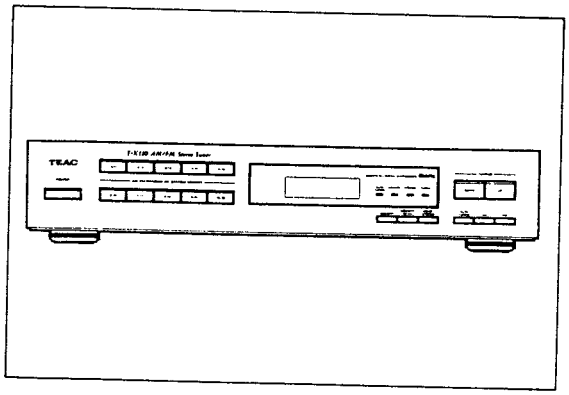
TEAC®



SERVICE MANUAL

T-X110

AM/FM Stereo Tuner

CAUTION

⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components— refer to the appropriate parts list and ensure exact replacement.

NOTE:

As regards the resistors and capacitors, refer to the circuit diagrams and the PCB ass'y drawings included in this brochure.

1 SPECIFICATIONS

〈FM Tuner Section (IHF)〉	
Tuning Range	87.5 MHz – 108.00 MHz (100 kHz steps, USA/Canada) (50 kHz steps, Europe/UK/Australia/General Export)
Usable Sensitivity	Mono: 11.2 dBf
50 dB Quieting Sensitivity	Mono: 23.3 dBf/Stereo: 39.2 dBf
AM Suppression Ratio (1 kHz)	60 dB
Capture Ratio	1.5 dB
Channel Selectivity	65 dB ±400 kHz
Image Rejection	60 dB (at 98 MHz)
Harmonic Distortion (1 kHz)	Mono: 0.2%/Stereo: 0.5%
Stereo Separation (1 kHz)	45 dB
Frequency Response	20 Hz – 15 kHz (+1/–2 dB)
Signal-to-Noise Ratio	Mono: 78 dB/Stereo: 72 dB
〈AM Tuner Section〉	
Tuning Range	520 kHz – 1710 kHz (10 kHz steps, USA/Canada) 522 kHz – 1611 kHz (9 kHz steps, Europe/UK/Australia/General Export)
Usable Sensitivity	500 μV/m
Selectivity	32 dB ±9 kHz
Image Rejection	46 dB (at 1000 kHz)
Harmonic Distortion	0.8%
Signal-to-Noise Ratio	45 dB
〈General〉	
Power Requirements	115/230 V AC, 50/60 Hz (General Export) 120 V AC, 60 Hz (USA/Canada) 220 V AC, 50 Hz (Europe) 240 V AC, 50 Hz (UK/Australia)
Power Consumption	7W
Dimensions (WxHxD)	435 x 83 x 225 mm (17-1/8" x 3-1/4" x 8-7/8")
Weight (net)	2.8 kg (6.19 lbs)
Standard Accessories	AM Loop Antenna, FM T-shaped Antenna, Matching Transformer (for 300 ohms to 75 ohms conversion, Europe models only), RCA pin-plug cord

* Improvements may result in specification or feature changing without notice.

2 ALIGNMENT PROCEDURES

1. AM Tuning Voltage Adjustment
(Input) No signal.
1. Adjust trimmer condenser TC21 to near the center of its variable range.
2. Connect the Digital Voltage Meter input to TP21.
3. Set the receiver frequency to 520kHz.
4. Adjust L23 for a Digital Voltage Meter reading of 1V.
5. Set the receiver frequency to 1610kHz.
6. Verify that the Digital Voltage Meter reads between 7 and 8V.

2. AM IFT Adjustment
(Input) Set the SSG as follows:
Frequency 1000kHz
Modulation ..... AM 30%. 400Hz
1. Connect the Level Meter input to the RCA Jack.
2. Set the receiver frequency to 1000kHz.
3. Set the SSG output level to the range in which the receiver output level and SSG output level vary linearly. (The range where the AGC is not effective.)
4. Adjust T42 for a maximum reading on the Level Meter.

3. AM Tracking Adjustment
(Input) Set the SSG as follows:
Modulation ..... AM 30%. 400Hz
1. Set the receiver frequency to 600kHz.
2. Connect the Level Meter input to the RCA Jack.
3. Set the SSG output level so that the receiver output level and SSG output level vary linearly.
4. Adjust L22 for a maximum reading on the Level Meter.
5. Set the receiver frequency to 1400kHz.
6. Adjust TC21 for a maximum reading on the Level Meter.
7. Repeat step 1 through 6.

4. AM Auto-Scan Stop-Level Adjustment
(Input) Set the SSG as follows:
Output level 60dBμ/m
Modulation ..... AM 30%. 400Hz
1. Set the receiver frequency to 1000kHz.
2. Adjust SVR42 to the point at which the Tuned Indicator light comes on.

5. FM Tuning-Voltage and Tracking Adjustment
The FM front end has already been adjusted. And requires no further adjustment.

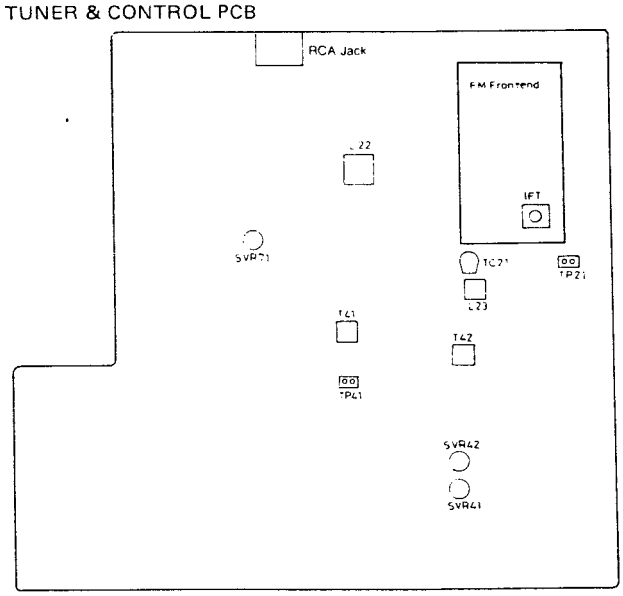
6. FM IFT Adjustment
(Input) Set the SSG as follows:
Output level ..... 0 to 5dBμ
Frequency 98MHz
Modulation ..... FM 75kHz deviation, 1kHz.
1. Set the receiver frequency to 98MHz.
2. Connect the Level Meter input to the RCA Jack.
3. Adjust the IFT on the FM Front End for a maximum reading on the Level Meter.

7. FM Detector Adjustment
(Input) Set the SSG as follows:
Output level ..... 0 to 60dBμ
Frequency 98MHz
Modulation ..... FM 75kHz deviation, 1kHz.
1. Connect the Digital Voltage Meter input to TP41.
2. Set the receiver frequency to 98MHz.
3. Adjust T41 for a Digital Voltage Meter reading of within +/−1mV.

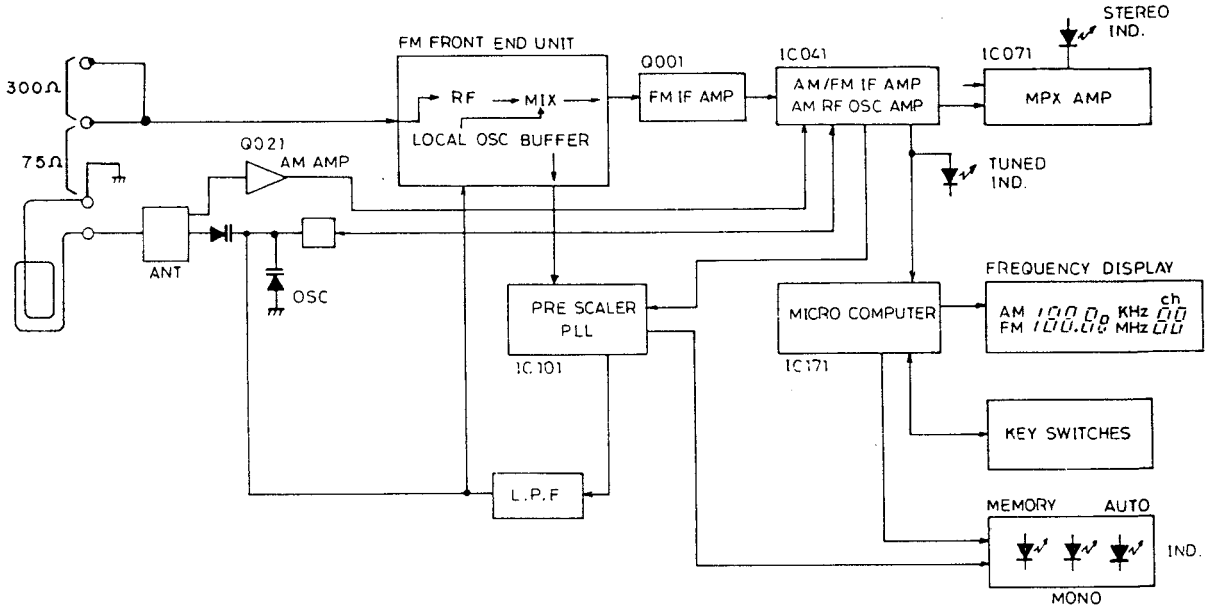
8. FM Auto-Scan Stop-Level Adjustment
(Input) Set the SSG as follows:
Output level 26dBμ
Frequency 98MHz
Modulation ..... FM 75kHz deviation, 1kHz.
1. Set the receiver frequency to 98MHz.
2. Adjust SVR41 to the position at which the Tuned Indicator light comes on.

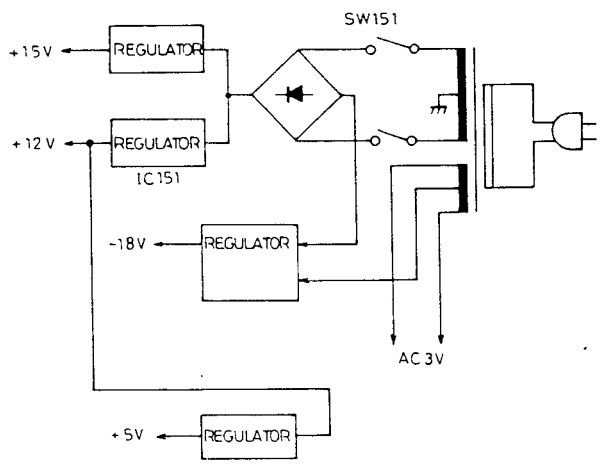
9. Separation Adjustment
(Input) Set the SSG as follows:
Output level 60dBμ
Frequency 98MHz
Modulation ..... Main 67.5kHz deviation.
Pilot 7.5kHz deviation.
1. Set the FM Mono Switch to Stereo.
2. Connect the Level Meter input to the RCA Jack.
3. Set the stereo modulater for a R-ch signal output.
4. Adjust SVR71 for a maximum reading of the L-ch signal on the Level Meter.
5. Set the stereo modulateer for an L-ch signal output.
6. Verify that the R-ch singnal reading on the Level Meter is about the same as that of step 4.

TUNER & CONTROL PCB



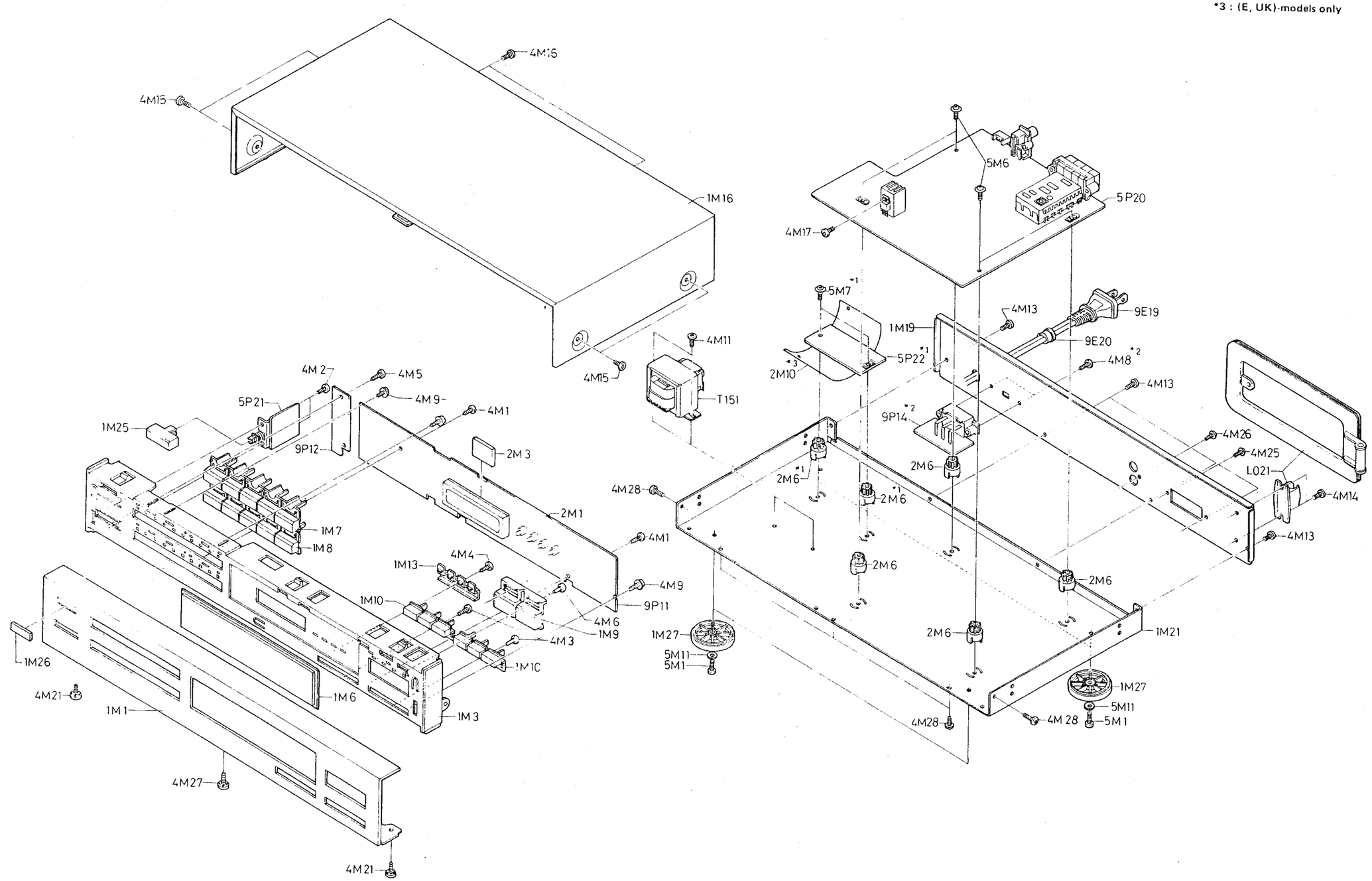
3 BLOCK DIAGRAM





4 EXPLODED VIEW AND PARTS LIST

NOTE
*1 : Except (GE)-model
*2 : (GE)-model only
*3 : (E, UK)-models only



EXPLODED VIEW

REF. NO.	PARTS NO.	DESCRITION
IM 1	*9A02122700	FRONT PANEL
IM 3	*9A02122800	FRONT BASE
IM 6	*9A02122900	DISPLAY GLASS
IM 7	9A02123000	TACT BUTTON, 5
IM 8	9A02123100	TACT BUTTON, 5
IM 9	9A02123200	TACT BUTTON
IM10	9A02123300	TACT BUTTON
IM13	*9A01354300	LED LENS
IM15	*9A02123400	CABINET
IM19	*9A02120000	REAR PANEL [C]
	*9A02121500	REAR PANEL [E]
	*9A02122100	REAR PANEL [UK]
	*9A02121200	REAR PANEL [GE]
IM21	*9A02123500	BOTTOM CHASSIS
IM25	5800752300	POWER BUTTON B
IM26	*5720175500	TEAC EMBLEM
IM27	*9260082400	FOOT ASSY
2M 1	*9A01519000	LED SPACER
2M 3	*9A02123600	SPACER
2M 6	*9A02123700	STUD
2M10	*9A02121600	COVER, INSULATION [E,UK]
4M 1-M 6	*9A00392900	TAP SCREW TBB+26X08-Y
4M 8	*9A00313700	TAP SCREW TBB+26X08-B [GE]
4M 9	*9A02120100	TAP SCREW TPPW07+26X08-Y
4M11	*9A00315800	TAP SCREW TSB+30X06-Y
4M13-M16	*9A00389600	TAP SCREW TSB+30X08-B
4M17	*9A00629500	TAP SCREW TSB+30X08-Y
4M21	*9A02120200	TAP SCREW TSBK+30X06-B
4M25-M28	*9A02123800	TAP SCREW TPB+30X08-B
5M 1	*9A02123900	TAP SCREW TSB+30X10-Y
5M 6	*9A02120300	TAP SCREW TSC08+30X18-Y
5M 7	*9A02120300	TAP SCREW TSC08 [C,E,UK]
5M11	*9A02102700	PLAIN WASHER, Y
5P20	*9A02119400	MAIN PCB ASSY [C]
	*9A02119410	MAIN PCB ASSY [E]
	*9A02119420	MAIN PCB ASSY [UK,GE]
5P21	*9A02119500	POWER SWITCH PCB ASSY
5P22	*9A02119600	POWER SUPLLY PCB ASSY [C]
	*9A02119610	POWER SUP. PCB ASSY [E,UK]
9P11	*9A02119700	FREQ. DISPLAY PCB ASSY [C]
	*9A02119710	FREQ. DISPLAY PCB ASSY [E]
	*9A02119720	FRE. DIS. PCB ASSY [UK,GE]
9P12	*9A02119800	TUNING UP/DOWN PCB ASSY
9E19	⚠*9A01625900	LINE CORD [C]
	⚠*9A01193100	LINE CORD [E]
	⚠*9A02110200	LINE CORD [UK]
	⚠*9A02110800	LINE CORD [GE]
9E20	⚠*9A00325300	CORD STOPPER
T101	9A01632200	POWER TRANSFORMER [C]
	⚠ 9A02121400	POWER TRANSFORMER [E]
	⚠ 9A02122000	POWER TRANSFORMER [UK]
	⚠ 9A02121100	POWER TRANSFORMER [GE]
L 21	*9A01209600	LOOP ANTENNA

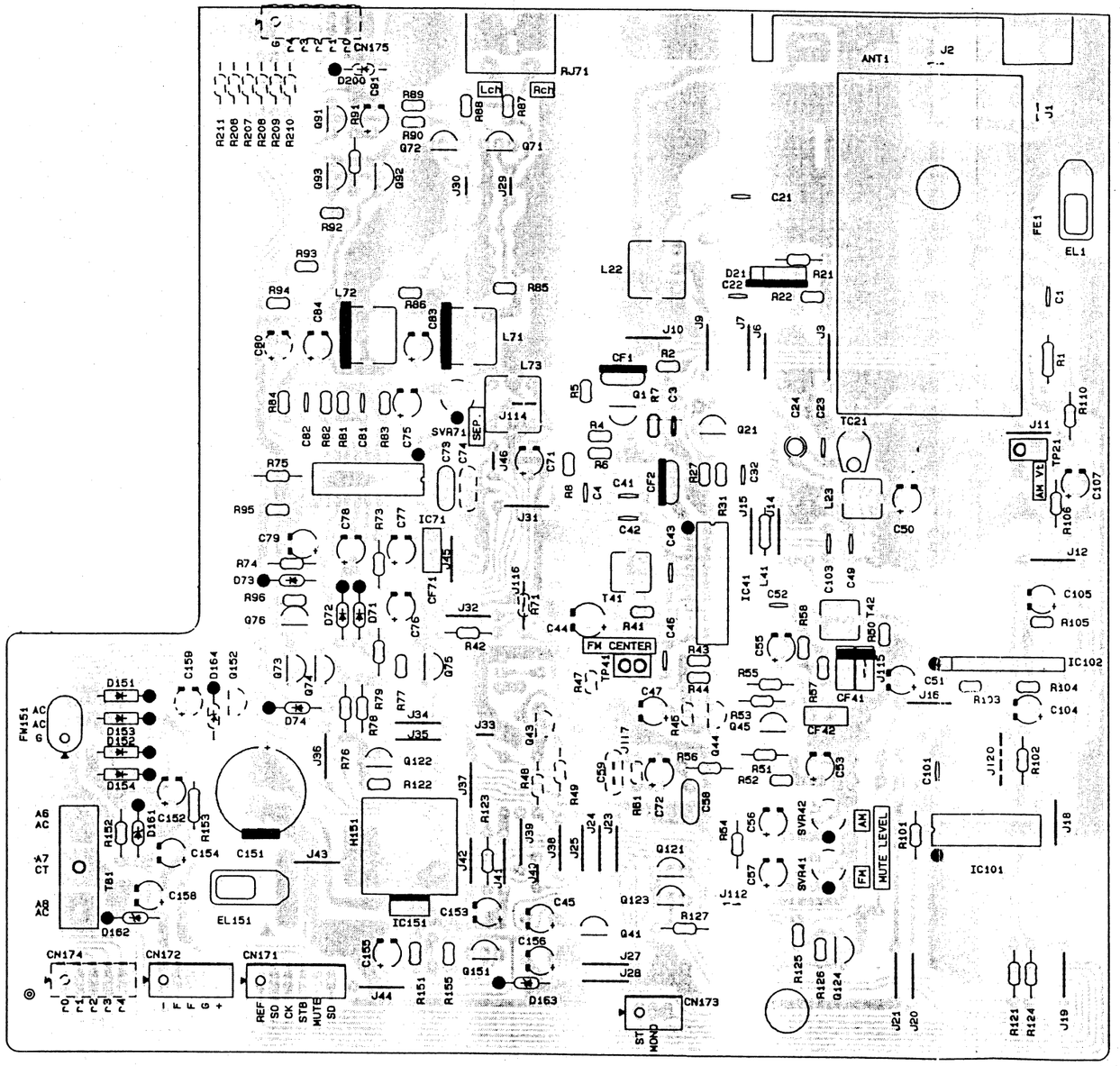
INCLUDED ACCESORIES

REF. NO.	PARTS NO.	DESCRITION
	*9A01842100	OWNER'S MANUAL(M) [T-X110]
	*9A01525200	FM ANTENNA (CORD)
	*9A01641800	RCA PIN CORD ASSY
	*9A02124400	MATCHING ADAPTOR [E]

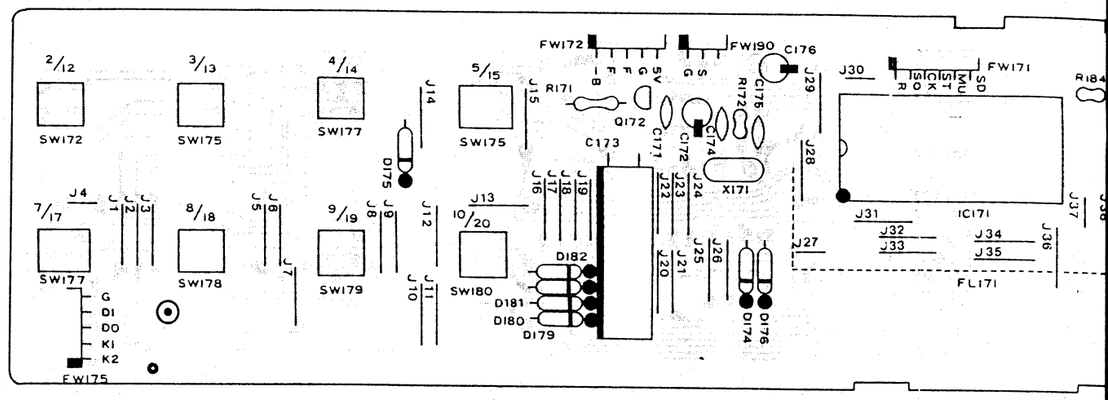
[C]:CANADA [E]:EUROPE [UK]:U.K. [GE]:GENERAL EXPORT Parts marked with *require longer delivery time.

5 P.C. BOARDS AND PARTS LIST

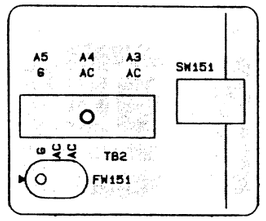
MAIN PCB ASSY



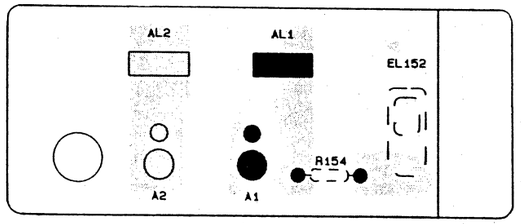
FREQUENCY DISPLAY PCB ASSY



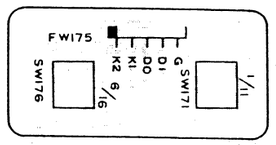
POWER SWITCH PCB ASSY



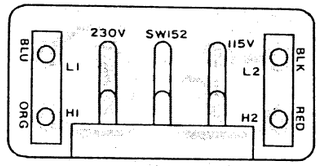
POWER SUPPLY PCB ASSY



TUNING UP/DOWN PCB ASSY



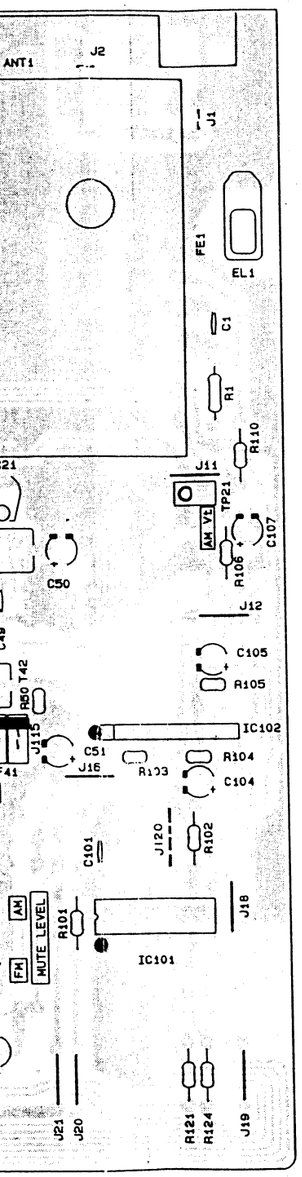
POWER SELECTOR PCB ASSY (GE):MODEL ONLY



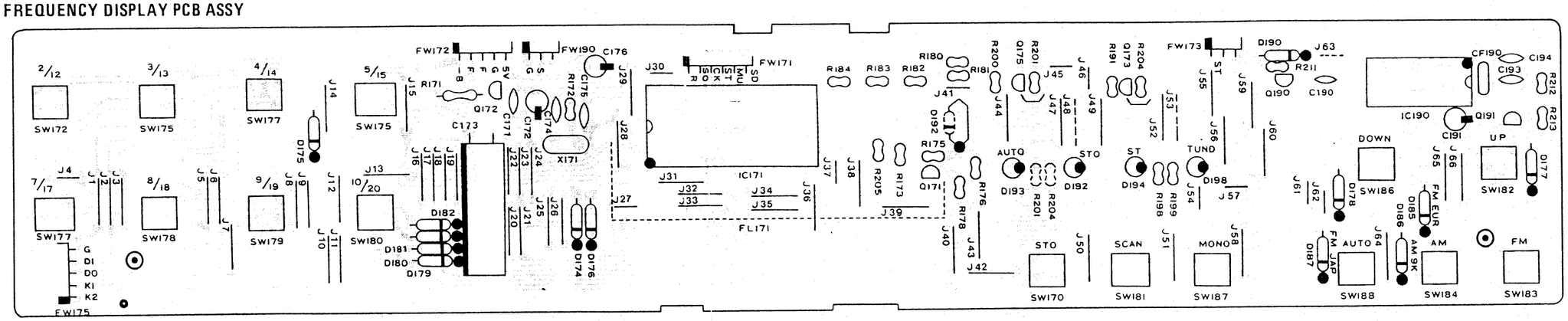
FREQUENCY

REF. NO.
IC171
Q171
Q172,173
Q175
D174-182
D185-186
D191-194
X171
SW170
SW172-175
SW177-184
SW186-188
FL171
FW171
FW172
FW173
FW175

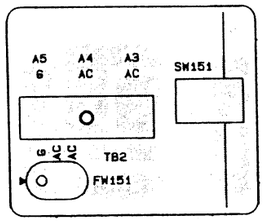
[C]:CANADA



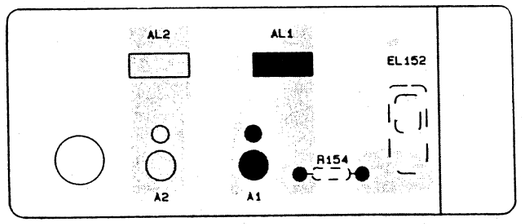
FREQUENCY DISPLAY PCB ASSY



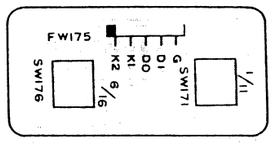
POWER SWITCH PCB ASSY



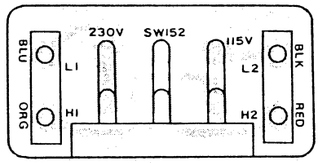
POWER SUPPLY PCB ASSY



TUNING UP/DOWN PCB ASSY



POWER SELECTOR PCB ASSY (GE):MODEL ONLY



FREQUENCY DISPLAY PCB ASY

REF. NO.	PARTS NO.	DESCRITION
	*9A02119700	FREQ. DISPLAY PCB ASSY [C]
	*9A02119710	FREQ. DISPLAY PCB ASSY [E]
	*9A02119720	FRE. DIS. PCB ASSY [UK,GE]
	*9A02120700	FREQUENCY DISPLAY PCB
IC171	9A02124000	IC TC9303AN-014
Q171	9A00292800	TRANSISTOR 2SC2458GRBL
Q172,173	9A01648700	TRANSISTOR 2SC1815-GRBL
Q175	9A01648700	TRANSISTOR 2SC1815-GRBL
D174-182	9A01209500	DIODE 1N4148
D185-186	9A01209500	DIODE 1N4148 [E,UK,GE]
D191-194	9A01206600	LED
X171	9A01196000	QUARTZ OSCILLATOR UNIT
SW170	9A02120900	TACT SWITCH
SW172-175	9A02120900	TACT SWITCH
SW177-184	9A02120900	TACT SWITCH
SW186-188	9A02120900	TACT SWITCH
FL171	9A01195500	FLUORESCENCE LAMP
FW171	*9A01649900	6-LEAD, FLAT CABLE
FW172	*9A02124100	5-LEAD, FLAT CABLE
FW173	*9A00596300	3-LEAD FLAT CABLE
FW175	*9A02124200	5-LEAD, FLAT CABLE

TUNING UP/DOWN PCB ASSY

REF. NO.	PARTS NO.	DESCRITION
	*9A02119800	TUNING UP/DOWN PCB ASSY
	*9A02120800	TUNING UP/DOWN PCB
SW171,176	9A02120900	TACT SWITCH

POWER SELECTOR PCB ASSY [GE]

REF. NO.	PARTS NO.	DESCRITION
	*9A02152200	POWER SELECTOR PCB ASSY
	*9A02152300	POWER SELECTOR PCB
SW152	⚠ 9A02152400	SLIDE SWITCH
TB 3, 4	*9A02152500	TERMINAL PIN

[C]:CANADA [E]:EUROPE [UK]:U.K. [GE]:GENERAL EXPORT

Parts marked with *require longer delivery time.

MAIN PCB ASSY

REF. NO.	PARTS NO.	DESCRITION
	*9A02119400	MAIN PCB ASSY [C]
	*9A02119410	MAIN PCB ASSY [E]
	*9A02119420	MAIN PCB ASSY [UK,GE]
	9A02120400	MAIN PCB
IC 41	9A01198300	IC LA1266
IC 71	9A00598600	IC LA3401
IC101	9A01207700	IC TC9172AP
IC102	9A01200200	IC NJM2904S
IC151	9A01632000	IC NJM78M12
Q 1	9A00659900	TRANSISTOR 2SC2668-O,Y
Q 21	9A01649300	TRANSISTOR 2SK161-Y,GR
Q 41, 74	9A01642900	TRANSISTOR RN-2209
Q 43	9A01648700	TR. 2SC1815-GRBL [E,UK,GE]
Q 44	9A02121300	TR. 2SK381-D,E [E,UK,GE]
Q 45, 71	9A01648700	TRANSISTOR 2SC1815-GRBL
Q 72, 76	9A01648700	TRANSISTOR 2SC1815-GRBL
Q 73, 75	9A01642800	TRANSISTOR RN-1209
Q 91	9A01642900	TRANSISTOR RN-2209
Q 92, 93	9A01648700	TRANSISTOR 2SC1815-GRBL
Q121,123	9A01648700	TRANSISTOR 2SC1815-GRBL
Q122	9A01648600	TRANSISTOR 2SB621NC-R,S
Q124	9A01209800	TRANSISTOR 2SA1015-Y,GR
Q151	9A01649200	TRANSISTOR 2SD592NC-R,S
Q152	9A00577500	TRANSISTOR 2SK381-E [E]
D 21, 22	9A00659800	DIODE KV1236Z-Z1
D 71- 74	9A01209500	DIODE 1N4148
D151-154	9A00275400	DIODE 1N4002
D161	9A00653500	ZENER DIODE ZD50-200
D162	9A01647000	ZENER DIODE ZD50-039
D163	9A00598100	ZENER DIODE ZD50-062
D164	9A01647100	ZENER DIODE ZD50-147 [E]
TC 21	9A00282800	C. TRIMMER CTZ5IC135
SVR41	9A00717600	R. SEMI-VARIABLE
SVR42	9A00612600	R. SEMI-VARIABLE
SVR71	9A00301100	R. SEMI-VARIABLE
T 41	9A00601400	FM IFT
T 42	9A00601300	AM IFT
L 22	9A00600900	MW ANT COIL
L 23	9A00660100	MW OSC COIL
L 41	9A00595200	INDUCTOR (1MH)
L 71, 72	9A01648000	FILTER BLOCK
L 73	9A00285500	FILTER COIL [E]
CF 1, 2	9A01206400	CERAMIC FILTER [E]
CF 1, 2	9A01524600	CERAMIC FILTER [C,UK,GE]
CF 41	9A01206500	CERAMIC FILTER
CF 42	9A01193500	CERAMIC FILTER
CF 71	9A01193700	CERAMIC FILTER
CN171	9A01213200	CONNECTOR
CN172	9A01213100	CONNECTOR
CN173	9A01212900	CONNECTOR
ANT 1	9A01525700	ANTENNA TERMINAL [C,UK,GE]
	9A01208700	ANTENNA TERMINAL [E]
FE 1	9A00602200	FM FRONTEND [C,UK,GE]
	9A02121700	FM FRONTEND [E]
RJ 71	9A01646800	RCA JACK 2P

MAIN PCB ASSY

REF. NO.	PARTS NO.	DESCRITION
TP 21, 41	*9A01196800	MINI TERMINAL PLATE
TB 1	*9A01646300	TERMINAL PIN
HS 1	*9A00717900	HEAT SINK
FW151	*9A00302000	3-LEAD FLAT CABLE

POWER SWITCH PCB ASSY

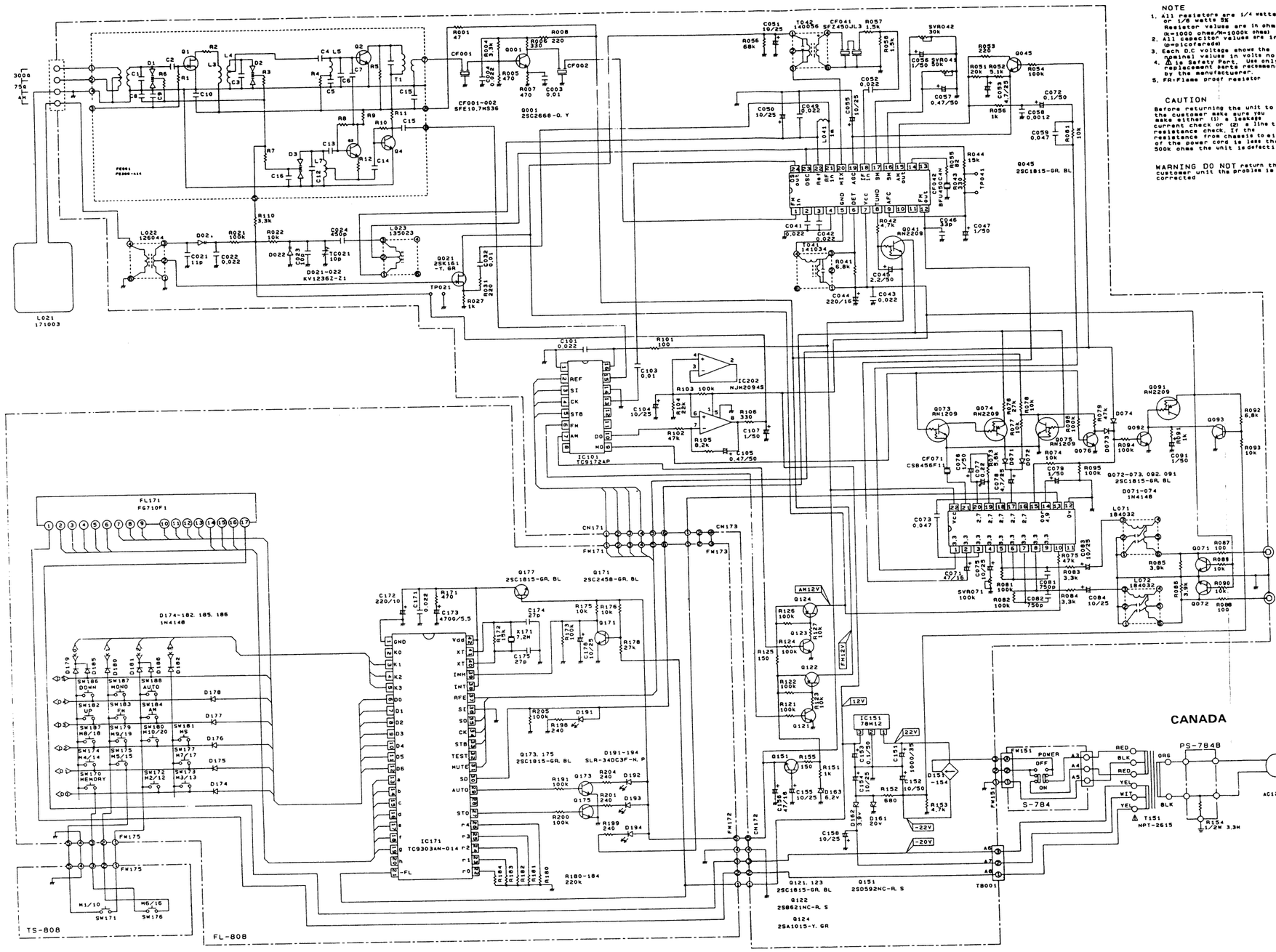
REF. NO.	PARTS NO.	DESCRITION
	*9A02119500	POWER SWITCH PCB ASSY
	*9A02120500	POWER SWITCH PCB
SW151	⚠ 9A01643900	PUSH SWITCH

POWER SUPPLY PCB ASSY

REF. NO.	PARTS NO.	DESCRITION
	*9A02119600	POWER SUPPLY PCB ASSY [C]
	*9A02119610	POWER SUP. PCB ASSY [E,UK]
	*9A02120600	POWER SUPPLY PCB
R154	⚠ 9A01521000	R. CARBON KA50XT335J [C]
A 1, 2	*9A00280400	TERMINAL PIN

[C]:CANADA [E]:EUROPE [UK]:U.K. [GE]:GENERAL EXPORT

Parts marked with *require longer delivery time.


NOTE
1. All resistors are 1/4 watts or 1/6 watts 5%
Resistor values are in ohms.
(k=1000 ohms/M=1000k ohms)
2. All capacitor values are in microfarads. (µ=microfarads)
3. Each D.C voltage shows the nominal values in volts no input signal.
4. ⚠ is Serety Part. Use only replacement parts recommended by the manufacturer.
5. FR=Flame proof resistor
CAUTION
Before returning the unit to the customer make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the resistance from chassis to either side of the power cord is less than 500k ohms the unit is defective
WARNING DO NOT return the unit to the customer until the problem is located and corrected
U.K
GENERAL EXPORT
CANADA
TS-808
FL-808

INSTRUCTIONS FOR SERVICE PERSONNEL

BEFORE RETURNING APPLIANCE TO THE CUSTOMER, MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT.

T-X110

AM/FM Stereo Tuner

1st Issue; January 1990

1 2 3 4 5 6 7 8

A B C D E

NOTE
1. All resistors are 1/4 watts or 1/6 watts 5%
   Resistor values are in ohms.
   (k=1000 ohms/M=1000k ohms)
2. All capacitor values are in microferads, (p=picoferads)
3. Each D.C voltage shows the nominal values in volts no input signal.
4. ⚠ is Safety Part. Use only replacement parts recommended by the manufacturerer.
5. FR=Flame proof resistor

CAUTION
Before returning the unit to the customer make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the resistance from chassis to either side of the power cord is less than 500k ohms the unit is defective

WARNING DO NOT return the unit to the customer unit the problem is located and corrected

EUROPE

T-X110

AM/FM Stereo Tuner

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